

**RESPONSE TO
MDE LETTER
DATED AUGUST 23, 2006**

SEPTEMBER 25, 2006

Case No. 2006-0303-BA2
Jacksonville Exxon R/S No. 2-8077
14258 Jarrettsville Pike, Phoenix
Baltimore County, Maryland
Facility I.D. No. 12342

ExxonMobil
Refining & Supply Company
3225 Gallows Road
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ExxonMobil
Refining & Supply

September 25, 2006

Mr. Herb Meade
Administrator, Oil Control Program
Maryland Department of the Environment
1800 Washington Boulevard, Suite 620
Baltimore, Maryland 21230-1719

RE: Response to MDE Letter dated August 23, 2006
Case No. 2006-0303-BA2
Jacksonville Exxon R/S No. 2-8077
14258 Jarrettsville Pike, Phoenix
Baltimore County, Maryland
Facility I.D. No. 12342
Via Hand Delivery

Dear Mr. Meade:

This letter is in response to the Maryland Department of the Environment's (MDE's) letter to ExxonMobil dated August 23, 2006. ExxonMobil's responses to the MDE's comments and requests are addressed in the order in which they appear in that letter.

Emergency Phase of Cleanup Activities

We recognize that the MDE would like ExxonMobil to submit work plans to the MDE for review and approval going forward. To that end, attached to this response we have included a work plan identifying proposed additional monitoring wells, the proposed well sampling frequency and the proposed analytical parameters. Also attached is an Updated Interim Remedial Measures Plan. Although MDE stated that the cleanup is no longer in the "emergency phase," there is still a high level of ongoing activity. ExxonMobil will continue to keep the MDE informed regarding field activities, future site characterization, system modifications and remedial actions. However, please feel free to call me directly should any communication issues come to your attention. In addition, please feel free to visit the site at any time.

Drinking Water Well at 14301 Jarrettsville Pike

The private supply well at this address was abandoned on April 14, 2006 during emergency response activities to prevent it from serving as a vertical conduit for movement of gasoline constituents. A copy of the Water Well Abandonment-Sealing Report Form, which was submitted to the MDE's Water

Management Administration, is enclosed for your records. We believe the proactive abandonment of this private supply well was a prudent decision done in the context of emergency response activities. Although there are no current plans to abandon any wells, the MDE will be notified of any future abandonment of monitoring wells or private supply wells.

With respect to the alternate water supply that was provided to the 14301 Jarrettsville Pike property, we offer the explanation below.

- Upon identification of gasoline constituents in the private supply well we immediately mobilized a poly tank and connected it to the existing water supply system. This corresponds to a "Response Level 2" as described in the Water Contingency Plan
- We subsequently connected the existing water supply system to the existing (but unused) private supply well located on the adjacent property now owned by ExxonMobil (3410 Sweet Air Road). This corresponds to a "Response Level 3" as described in the Water Contingency Plan. The alternate well provided is located within 20 feet of the property line between the two properties and an access easement will be provided to the owners of 14301 Jarrettsville Pike.
- Finally, we have installed a point-of entry treatment (POET) system to treat the water from the 3410 Sweet Air Road private supply well. This corresponds to a "Response Level 1" as described in the Water Contingency Plan.

The connection of the 3410 Sweet Air Road well to the 14301 Jarrettsville Pike property was discussed with and approved by the owner of 14301 Jarrettsville Pike and the Baltimore County Health Department (BCHD). A BCHD representative conducted an inspection of the plumbing prior to the final connection. If you have any further questions on this issue, please feel free to call me directly.

Monitoring Well Network Work Plan and Sampling Frequency and Analytical Parameters Work Plan

Both our proposals for the well network and sampling frequency and analytical parameters are incorporated in the attached Monitoring Well Network and Sampling Plan. See Attachment 1.

Updated Interim Remedial Measures Plan

An update to the March 27, 2006 Interim Remedial Measures Plan is also attached to this letter. See Attachment 2.

Residential Soil Vapor Reports

The requested map including the August sampling results was previously provided to the MDE. As discussed during a September 7, 2006 meeting, the most recent soil vapor sampling event was conducted the week of September 11, 2006. This data will also be compiled and submitted to the MDE upon receipt and review of final data, and a similar map will be provided.

Drinking Water Well at 3313 Paper Mill Road

As discussed previously, negotiations with the property owner and a POET design are being completed for the 3313 Paper Mill Road property. As an initial step in investigating the conditions on both water supply wells at the property, we have received approval from the property owner to install separate

Mr. Herb Meade
September 25, 2006
Page 3

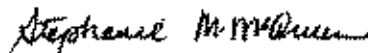
sampling ports on the influent lines for the two private supply wells located on this property. As requested, the 3305 Paper Mill Road property has been added to the weekly sampling schedule.

Preliminary Hydrogeologic and Containment Assessment Report

The well construction details and the remediation well annotations are included in the bi-weekly site status updates. The groundwater analytical and gauging tables included in the bi-weekly updates have also been sorted by quadrant. A map showing domestic well yields is being prepared and will be submitted to the MDE within approximately ten days.

Please contact me after you and your staff have had a chance to review the information provided. At that time we can determine if a meeting is appropriate to discuss the investigative or remedial activities.

Sincerely,



Stephanie M. McQueen

cc: Ms. Yolande Norman
Ms. Ellen Jackson

MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION
1800 Washington Blvd., Baltimore, Maryland 21230 (410) 537-5784

WATER WELL ABANDONMENT-SEALING REPORT FORM

SUBMIT COPIES OF COMPLETED FORM TO:

- * COUNTY ENVIRONMENT AGENCY (contact MDE, WMDA if address needed)
- * WELL OWNER
- * MDE, WATER MANAGEMENT ADMINISTRATION, WELL PROGRAM

DATE WELL ABANDONED: 4-14-06 (month/day/year)

* PERMIT NUMBER OF ABANDONED WELL (if any):

* PERMIT NUMBER OF REPLACEMENT WELL:

* PERSON ABANDONING WELL: Stephen Saut

* OWNER'S NAME: Bradford Federal Savings

* WELL LOCATION:

COUNTY: Baltimore

NEAREST TOWN: Jacksonville

TAX MAP 35 BLOCK PARCEL 31

SUBDIVISION:

SECTION: LOT:

NEAREST ROAD: 14301 Jarrellsville Rd

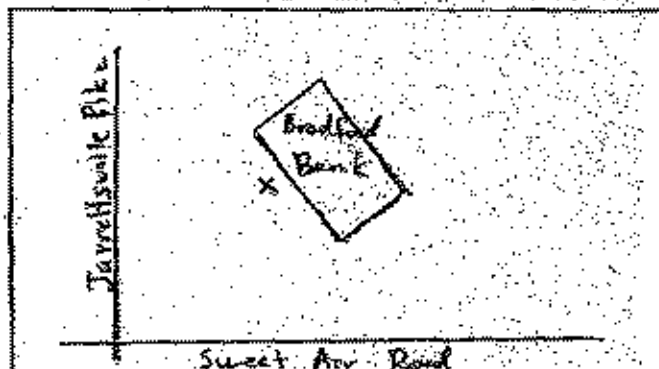
BA 73 - 1687

none

WELL DRILLERS LICENSE NUMBER: 421

CIRCLE: MWD/MSD/MGD

SITE LOCATION MAP



* TYPE OF WELL BEING ABANDONED:

☒ DRILLED ☐ JETTED
☐ BORED/AUGERED ☐ HAND DUG
☐ OTHER (specify):

* USE CODE:

☒ DOMESTIC ☐ MUNICIPAL/PUBLIC
☐ IRRIGATION ☐ INDUSTRIAL
☐ TEST/OBSERVATION ☐ GEOTHERMAL

* TYPE OF CASING:

☒ STEEL ☐ PLASTIC
☐ CONCRETE ☐ OTHER (specify):

* SIZE OF CASING: 6 INCHES IN DIAMETER

* DEPTH OF WELL: 300+ FEET DEEP

* WAS ANY CASING REMOVED? ☐ YES ☒ NO
If yes, length removed, in feet:

* WAS CASING RIPPED OR PERFORATED? ☐ YES ☒ NO

LOG OF SEALING MATERIAL

MATERIAL	FEET	
	FROM	TO
Cement Grout	30	100
Bentonite chips	100	300+
VOLUME OF MATERIAL USED		
600 lb. Portland Cement 94 bags (50lb) Bentonite (4700 pounds) Chips		

SIGNATURE MASTER WELL DRILLER OR SUPERVISING SANITARIAN

LICENSE #

421 CIRCLE ONE

DATE 5-14-06

ATTACHMENT 1 MONITORING WELL NETWORK AND SAMPLING PLAN

Exxon RAS #2-8077
Facility I.D. No. 12342
Case No. 2006-0303-BA2
14258 Jarrettsville Pike
Phoenix, Maryland

This Monitoring Well Network and Sampling Plan is submitted by Kleinfelder East, Inc. (Kleinfelder) on behalf of Exxon Mobil Corporation (ExxonMobil) in response to the August 23, 2006 letter¹ from the Maryland Department of Environment (MDE) requiring the submission of a *Monitoring Well Network Work Plan* and a *Plan* for the proposed frequency and analytical parameters for monitoring well sampling.

Monitoring Well Network Plan

The proposed Monitoring Well Network Plan is documented graphically in Figure 1 and is tabulated in Table 1. Figure 1 identifies the locations of groundwater monitoring wells installed to date, surface water sampling locations, and proposed groundwater monitoring wells (including remediation wells) considered necessary to complete the monitoring well network. The proposed monitoring well network is comprised of the following monitoring points:

- 203 existing groundwater monitoring wells;
- 8 proposed additional groundwater monitoring wells;
- 5 surface water sampling locations; and,
- 3 unused private supply wells.

The 203 existing and 8 proposed groundwater monitoring wells identified for future sampling range in depth from 10 feet to 400 feet. These groundwater monitoring wells are (or will be) constructed at variable depths to monitor the water table elevation ("A" zone), intermediate depths below the water table ("B" zone), and greater depths generally corresponding to the depths of private supply wells in the general vicinity ("C" zone). The depths and locations of these wells were determined based on a comprehensive analysis of hydrogeologic conditions as documented in the July 2006 *Preliminary Hydrogeologic and Contaminant Assessment Report*² (PHCAR).

Proposed Additional Groundwater Monitoring Wells

Eight additional groundwater monitoring wells are proposed to supplement the existing groundwater monitoring well network. These additional groundwater monitoring wells will be drilled and installed using methods consistent with wells already installed (PHCAR: Section 5.1). Of these, three additional deep "C" series groundwater monitoring wells are proposed to be

¹ MDE, August 23, 2006, Case No. 2006-0303-BA2, Jacksonville Exxon R/S No. 2-8077, 14258 Jarrettsville Pike, Phoenix, Baltimore County, Maryland, Facility I.D. No. 12342; Letter to ExxonMobil.

² Kleinfelder, July 2006, Preliminary Hydrogeologic and Contaminant Assessment Report, Exxon RAS #2-8077-14258 Jarrettsville Pike, Phoenix, Maryland, MDE Case Number 2006-0303BA2.

installed northeast of the service station property. Similar to previous activities, the deeper boreholes will be logged using borehole geophysical instrumentation, and will be hydraulically profiled using blank FLUTE® technology. Data derived from these activities will be evaluated to determine discrete sampling intervals that will be incorporated into a custom FLUTE® liner for sampling of the proposed "C" zone monitoring wells. Sampling intervals will be based on the evaluation of borehole geophysical and hydrologic FLUTE® data, and will be reviewed with MDE.

The location and proposed depths of these planned monitoring wells are identified on Figure 1. The following table summarizes the depth, location, and purpose of the proposed additional wells:

Proposed Monitoring Well Summary Table

Well ID	Depth (feet)	Purpose
<i>Northeast Locations</i>		
MW-92A	40	Water table well to complement MW-92 that was constructed below the water table due to slow recharge during drilling and construction.
MW-92C	400	Supplement deep monitoring well array in northeast. Depth based on private supply well depths in vicinity. Accessible drilling location for supplementing network.
MW-131C	300	Supplement deep monitoring well array in northeast. Depth based on private supply well depths in vicinity. Complements nearby shallow wells of the same series monitoring lateral dissolved-phase extent. Accessible drilling location for supplementing network.
MW-133C	200	Supplement deep monitoring well array in northeast. Depth based on private supply well depths in vicinity. Located upgradient of nearest private supply well. Accessible drilling location for supplementing network.
MW-162A	45	Intended to refine delineation. Located upgradient of private supply well. Depth overlaps open interval of private supply well.
MW-162B	60	Intended to refine delineation. Located upgradient of private supply well. Depth overlaps open interval of private supply well.
<i>Southwest Locations</i>		
MW-50B	55	Complement MW-50A and MW-50C
MW-163B	55	Intended to delineate "B" zone in southwest.

Note: Final depths and screen intervals will be determined in the field based on conditions encountered.

Monitoring Well Sampling Program

Groundwater and surface water monitoring locations are identified on Figure 1 and summarized in Tables 2a through 2c according to proposed sampling frequency. Three categories of sampling frequency are proposed: Bi-weekly (every other week), monthly, and quarterly. All bi-weekly locations would be sampled in the monthly event and both bi-weekly and monthly wells would be sampled during the comprehensive quarterly event. The sampling program as of August 2006 represents the starting point from which the proposed sampling program was developed. The monitoring wells proposed for bi-weekly sampling were selected based on one of three criteria: 1) sentinel monitoring of the extent of dissolved-phase hydrocarbons; 2) sentinel monitoring of the transverse groundwater capture lines (MW-77 and MW-71 lines in the northeast and southwest, respectively); and 3) historic dynamic conditions that warrant continued frequent monitoring.

The proposed analytical suite for future monitoring consists of benzene, toluene, ethylbenzene, and xylene (BTEX), MTBE, and TAME. Existing groundwater monitoring wells have been (or will be) sampled at least once for the full suite of volatile organic compounds (VOCs). The initial sampling event for additionally installed groundwater monitoring wells will consist of the full VOC suite. The final round of sampling for any given monitoring well will also consist of the full VOC suite.

The proposed monitoring well network and sampling plan is considered to be comprehensive and an incremental adjustment to the aggressive sampling efforts conducted during the emergency response phase of the project. As data are acquired and evaluated, future proposed modifications to the sampling program, including monitoring well abandonment, may be proposed. A work plan documenting such modifications will be submitted to MDE for review and approval prior to implementation.

Table 1
Proposed Monitoring Well Network - Comprehensive List

Exxon RAS #2-8077
14258 Jarrettsville Pike
Phoenix, Maryland

Well ID	Schedule	Group
MW-1	Quarterly	West
MW-1A	Quarterly	West
MW-2	Quarterly	West
MW-2A	Quarterly	West
MW-3	Quarterly	West
MW-4	Quarterly	West
MW-4A	Quarterly	West
MW-5	Quarterly	West
MW-6	Quarterly	West
MW-7	Monthly	West
MW-8	Quarterly	West
MW-9	Monthly	West
MW-12	Quarterly	West
MW-13	Quarterly	West
MW-14	Quarterly	West
MW-15	Quarterly	West
MW-16	Monthly	West
MW-17	Quarterly	West
MW-19	Quarterly	West
MW-20	Quarterly	West
MW-21	Quarterly	West
MW-22	Quarterly	West
MW-23	Monthly	West
MW-24	Quarterly	West
MW-25	Quarterly	West
MW-26	Quarterly	West
MW-27	Quarterly	West
MW-28	Quarterly	West
MW-29	Quarterly	West
MW-30	Quarterly	West
MW-31	Monthly	West
MW-32	Quarterly	East
MW-33	Quarterly	West
MW-34	Quarterly	West
MW-35	Quarterly	West
MW-36	Monthly	East
MW-37	Quarterly	East
MW-38	Quarterly	East
MW-39	Quarterly	West
MW-40	Quarterly	West
MW-41A	Quarterly	West
MW-41B	Quarterly	West
MW-41C	Monthly	West
MW-41C(120-130)	Monthly	West
MW-41C(190-195)	Monthly	West
MW-41C(75-80)	Monthly	West

Table 1
Proposed Monitoring Well Network - Comprehensive List

Exxon RAS #2-8077
14258 Jarrettsville Pike
Phoenix, Maryland

Well ID	Schedule	Group
MW-41C(95-97)	Monthly	West
MW-42A	Quarterly	West
MW-42B	Quarterly	West
MW-43A	Bi-Weekly	East
MW-43B	Bi-Weekly	East
MW-44	Quarterly	West
MW-45	Quarterly	East
MW-46	Monthly	West
MW-47A	Quarterly	East
MW-47B	Quarterly	East
MW-48A	Quarterly	East
MW-48B	Quarterly	East
MW-49	Monthly	West
MW-50	Monthly	West
MW-50C	Monthly	West
MW-51	Quarterly	West
MW-52	Quarterly	West
MW-53A	Monthly	West
MW-53B	Monthly	West
MW-53C	Monthly	West
MW-53C(215-220)	Monthly	West
MW-53C(225-235)	Monthly	West
MW-54	Quarterly	East
MW-55	Monthly	West
MW-56A	Monthly	West
MW-56B	Monthly	West
MW-56C	Monthly	West
MW-56C(100-110)	Monthly	West
MW-56C(310-315)	Monthly	West
MW-56C(320-325)	Monthly	West
MW-57	Quarterly	East
MW-58	Quarterly	East
MW-59A	Monthly	East
MW-59B	Monthly	East
MW-59D	Monthly	East
MW-60	Monthly	West
MW-61A	Quarterly	East
MW-61B	Quarterly	East
MW-62A	Quarterly	East
MW-62B	Quarterly	East
MW-63	Bi-Weekly	West
MW-64	Quarterly	West
MW-65	Bi-Weekly	West
MW-66	Quarterly	West
MW-67	Monthly	West
MW-68	Monthly	West

Table 1
Proposed Monitoring Well Network - Comprehensive List

Exxon RAS #2-8077
 14258 Jarrettsville Pike
 Phoenix, Maryland

Well ID	Schedule	Group
MW-69	Monthly	West
MW-70	Monthly	West
MW-71	Monthly	West
MW-72	Monthly	West
MW-73	Quarterly	East
MW-74	Monthly	East
MW-75	Monthly	East
MW-76	Quarterly	East
MW-77A	Monthly	East
MW-77B	Monthly	East
MW-77R	Monthly	East
MW-78A	Monthly	East
MW-78B	Monthly	East
MW-78C(60-70)	Monthly	East
MW-78R	Monthly	East
MW-79	Monthly	East
MW-80A	Bi-Weekly	East
MW-80B	Bi-Weekly	East
MW-81	Quarterly	East
MW-82	Quarterly	East
MW-82R	Quarterly	East
MW-83	Monthly	East
MW-83R	Quarterly	East
MW-84	Monthly	East
MW-85	Quarterly	East
MW-86	Quarterly	East
MW-87	Quarterly	East
MW-88	Quarterly	East
MW-89	Monthly	East
MW-90	Monthly	East
MW-91	Quarterly	East
MW-92	Quarterly	East
MW-93	Quarterly	East
MW-94	Quarterly	East
MW-95	Quarterly	East
MW-96A	Bi-Weekly	West
MW-96B	Monthly	West
MW-97	Quarterly	West
MW-98A	Quarterly	West
MW-98B	Quarterly	West
MW-99A	Quarterly	East
MW-99B	Quarterly	East
MW-100A	Monthly	East
MW-100B	Monthly	East
MW-101A	Quarterly	East
MW-101B	Quarterly	East

Table 1
Proposed Monitoring Well Network - Comprehensive List

Exxon RAS #2-8077
 14258 Jarrettsville Pike
 Phoenix, Maryland

Well ID	Schedule	Group
MW-102	Quarterly	West
MW-103	Quarterly	East
MW-104	Quarterly	East
MW-105	Quarterly	West
MW-106	Quarterly	East
MW-107	Quarterly	East
MW-108	Quarterly	East
MW-109	Monthly	West
MW-110	Monthly	East
MW-111	Monthly	West
MW-112	Quarterly	West
MW-113	Quarterly	West
MW-114	Quarterly	East
MW-116	Quarterly	West
MW-117	Quarterly	West
MW-118	Monthly	West
MW-119	Quarterly	West
MW-120	Quarterly	West
MW-121	Quarterly	East
MW-122	Quarterly	West
MW-123	Quarterly	West
MW-124	Quarterly	West
MW-125	Monthly	West
MW-126	Quarterly	West
MW-127	Monthly	West
MW-128A	Quarterly	West
MW-128B	Quarterly	West
MW-129A	Quarterly	West
MW-129B	Quarterly	West
MW-130	Quarterly	West
MW-131A	Bi-Weekly	East
MW-131B	Bi-Weekly	East
MW-132A	Monthly	East
MW-132B	Monthly	East
MW-133A	Quarterly	East
MW-133B	Quarterly	East
MW-134A	Monthly	East
MW-134B	Monthly	East
MW-135A	Monthly	East
MW-135B	Monthly	East
MW-136	Quarterly	East
MW-137	Quarterly	East
MW-138	Quarterly	East
MW-139	Monthly	West
MW-140A	Monthly	West
MW-140B	Monthly	West

Table 1
Proposed Monitoring Well Network - Comprehensive List

Exxon RAS #2-8077
14258 Jarrettsville Pike
Phoenix, Maryland

Well ID	Schedule	Group
MW-141A	Quarterly	West
MW-141B	Quarterly	West
MW-141C	Monthly	West
MW-142	Quarterly	East
MW-143	Quarterly	East
MW-144	Monthly	West
MW-146	Quarterly	West
MW-148A	Quarterly	West
MW-148B	Quarterly	West
MW-149	Quarterly	West
MW-150A	Bi-Weekly	East
MW-150B	Bi-Weekly	East
MW-151	Monthly	West
MW-152	Monthly	West
MW-153A	Monthly	West
MW-153B	Monthly	West
MW-160	Quarterly	West
MW-161	Quarterly	West
PW-01	Quarterly	West
PW-3501	Quarterly	East
PW-14311	Quarterly	East
POND01	Monthly	East
STREAM01	Monthly	East
STREAM02	Monthly	West
STREAM03	Monthly	West
STREAM04	Monthly	East

Table 2a
Proposed Bi-Weekly Sampling Locations

Exxon RAS #2-8077
14258 Jarrettsville Pike
Phoenix, Maryland

Well ID	Group
MW-43A	East
MW-43B	East
MW-63	West
MW-65	West
MW-80A	East
MW-80B	East
MW-96A	West
MW-131A	East
MW-131B	East
MW-150A	East
MW-150B	East

Table 2b
Proposed Monthly Sampling Locations

Exxon RAS #2-8077
14258 Jarrettsville Pike
Phoenix, Maryland

Well ID	Group
MW-78A	East
MW-78B	East
MW-78C(60-70)	East
MW-78R	East
MW-79	East
MW-80A	East
MW-80B	East
MW-83	East
MW-84	East
MW-89	East
MW-90	East
MW-96A	West
MW-96B	West
MW-100A	East
MW-100B	East
MW-109	West
MW-110	East
MW-111	West
MW-118	West
MW-125	West
MW-127	West
MW-131A	East
MW-131B	East
MW-132A	East
MW-132B	East
MW-134A	East
MW-134B	East
MW-135A	East
MW-135B	East
MW-139	West
MW-140A	West
MW-140B	West
MW-141C	West
MW-144	West
MW-150A	East
MW-150B	East
MW-151	West
MW-152	West
MW-153A	West
MW-153B	West
POND01	East
STREAM01	East
STREAM02	West
STREAM03	West
STREAM04	East

Table 2c
Proposed Quarterly Sampling Locations

Exxon RAS #2-8077
14258 Jarrettsville Pike
Phoenix, Maryland

Well ID	Group
MW-1	West
MW-1A	West
MW-2	West
MW-2A	West
MW-3	West
MW-4	West
MW-4A	West
MW-5	West
MW-6	West
MW-7	West
MW-8	West
MW-9	West
MW-12	West
MW-13	West
MW-14	West
MW-15	West
MW-16	West
MW-17	West
MW-19	West
MW-20	West
MW-21	West
MW-22	West
MW-23	West
MW-24	West
MW-25	West
MW-26	West
MW-27	West
MW-28	West
MW-29	West
MW-30	West
MW-31	West
MW-32	East
MW-33	West
MW-34	West
MW-35	West
MW-36	East
MW-37	East
MW-38	East
MW-39	West
MW-40	West
MW-41A	West
MW-41B	West
MW-41C	West
MW-41C(120-130)	West
MW-41C(190-195)	West
MW-41C(75-80)	West

Table 2c
Proposed Quarterly Sampling Locations

Exxon RAS #Z-8077
14258 Jarrettsville Pike
Phoenix, Maryland

Well ID	Group
MW-41C(95-97)	West
MW-42A	West
MW-42B	West
MW-43A	East
MW-43B	East
MW-44	West
MW-45	East
MW-46	West
MW-47A	East
MW-47B	East
MW-48A	East
MW-48B	East
MW-49	West
MW-50	West
MW-50C	West
MW-51	West
MW-52	West
MW-53A	West
MW-53B	West
MW-53C	West
MW-53C(215-220)	West
MW-53C(225-235)	West
MW-54	East
MW-55	West
MW-56A	West
MW-56B	West
MW-56C	West
MW-56C(100-110)	West
MW-56C(310-315)	West
MW-56C(320-325)	West
MW-57	East
MW-58	East
MW-59A	East
MW-59B	East
MW-59D	East
MW-60	West
MW-61A	East
MW-61B	East
MW-62A	East
MW-62B	East
MW-63	West
MW-64	West
MW-65	West
MW-66	West
MW-67	West
MW-68	West

Table 2c
Proposed Quarterly Sampling Locations

Exxon RAS #2-8077
14258 Jarrettsville Pike
Phoenix, Maryland

Well ID	Group
MW-69	West
MW-70	West
MW-71	West
MW-72	West
MW-73	East
MW-74	East
MW-75	East
MW-76	East
MW-77A	East
MW-77B	East
MW-77R	East
MW-78A	East
MW-78B	East
MW-78C(60-70)	East
MW-78R	East
MW-79	East
MW-80A	East
MW-80B	East
MW-81	East
MW-82	East
MW-82R	East
MW-83	East
MW-83R	East
MW-84	East
MW-85	East
MW-86	East
MW-87	East
MW-88	East
MW-89	East
MW-90	East
MW-91	East
MW-92	East
MW-93	East
MW-94	East
MW-95	East
MW-96A	West
MW-96B	West
MW-97	West
MW-98A	West
MW-98B	West
MW-99A	East
MW-99B	East
MW-100A	East
MW-100B	East
MW-101A	East
MW-101B	East

Table 2c
Proposed Quarterly Sampling Locations

Exxon RAS #2-8077
14258 Jarrettsville Pike
Phoenix, Maryland

Well ID	Group
MW-102	West
MW-103	East
MW-104	East
MW-105	West
MW-106	East
MW-107	East
MW-108	East
MW-109	West
MW-110	East
MW-111	West
MW-112	West
MW-113	West
MW-114	East
MW-116	West
MW-117	West
MW-118	West
MW-119	West
MW-120	West
MW-121	East
MW-122	West
MW-123	West
MW-124	West
MW-125	West
MW-126	West
MW-127	West
MW-128A	West
MW-128B	West
MW-129A	West
MW-129B	West
MW-130	West
MW-131A	East
MW-131B	East
MW-132A	East
MW-132B	East
MW-133A	East
MW-133B	East
MW-134A	East
MW-134B	East
MW-135A	East
MW-135B	East
MW-136	East
MW-137	East
MW-138	East
MW-139	West
MW-140A	West
MW-140B	West

Table 2c
Proposed Quarterly Sampling Locations

Exxon RAS #2-8077
14258 Jarrettsville Pike
Phoenix, Maryland

Well ID	Group
MW-141A	West
MW-141B	West
MW-141C	West
MW-142	East
MW-143	East
MW-144	West
MW-146	West
MW-148A	West
MW-148B	West
MW-149	West
MW-150A	East
MW-150B	East
MW-151	West
MW-152	West
MW-153A	West
MW-153B	West
MW-160	West
MW-161	West
PW-01	West
PW-3501	East
PW-14311	East

ATTACHMENT 2 UPDATED INTERIM REMEDIAL MEASURES PLAN

Exxon RAS # 2-8077
Facility I.D. No. 12342
Case Number 2006-0303-BA2
14258 Jarrettsville Pike
Phoenix, Maryland

INTRODUCTION

On behalf of Exxon Mobil Corporation (ExxonMobil), Kleinfelder East, Inc. (Kleinfelder) has prepared this Updated Interim Remedial Measures Plan for ongoing remedial activities at the ExxonMobil retail facility #2-8077 (Maryland Department of the Environment [MDE] Case Number 2006-0303BA2) located at 14258 Jarrettsville Pike, Phoenix, Maryland. This document was prepared in response to the August 23, 2006 letter from the MDE requiring ExxonMobil to prepare an *Updated Interim Remediation Plan* for the site. Remediation activities at the site and surrounding properties are being conducted according to the MDE-approved *Interim Remedial Measures (IRM) Plan* dated March 27, 2006. ExxonMobil has notified the MDE of additional remedial activities not detailed in the IRM Plan in the regular site status updates and other communications. This Updated IRM Plan details the additional remedial activities conducted to date and the near-term remediation plans.

Attached maps include a site plan showing the Exxon station, surrounding properties and monitoring well network (Figure 1), and a remediation equipment layout map showing the layout of the current remediation systems (Figure 2). Table 1 (attached) presents monitoring well construction and remediation well status.

As detailed in the March 27, 2006 IRM Plan, remediation methods include groundwater extraction via submersible pneumatic and electric pumps, soil vapor extraction (SVE), and dual phase extraction (DPE). These recovery activities are currently being conducted on up to 80 monitoring wells (extraction wells), on 15 separate properties.

Since the IRM Plan was submitted, groundwater treatment systems, consisting of air strippers, bioreactors, and carbon adsorbers, are being used to treat water recovered from both the northeast and southwest quadrants, and discharging the treated water back to surface water bodies within each quadrant in accordance with the general discharge permit. ExxonMobil notified the MDE of the onsite groundwater treatment systems prior to bringing them on line and initiating surface water discharge. Extracted soil vapors are treated using oxidizers located on the Exxon Station property and the 3410 Sweet Air Road property.

Recovery and treatment activities are conducted with equipment housed in trailers or temporary structures to allow for operational flexibility in the interim until permanent equipment is designed and installed onsite. Since the IRM Plan was submitted, the majority of the remediation piping connecting the recovery wells to the treatment systems and tanks has been installed below grade. Details of the current remediation equipment and upgrades are presented in the following sections.

CURRENT REMEDIATION OBJECTIVES

The remediation objectives continue to be hydrocarbon recovery and hydraulic control. The current extraction well network is being utilized to induce a hydraulic gradient towards recovery wells on the station and on properties located northeast and southwest of the ExxonMobil station. The remedial objective is to minimize further migration of hydrocarbons by inducing a gradient toward the recovery wells and affecting hydraulic control through pumping. Through September 18, 2006, 227 monitoring wells have been installed at the site and surrounding properties. Four of these monitoring wells have been abandoned, and approximately 80 of these wells are utilized for recovery activities. The monitoring well network is gauged and sampled on a regular basis, as discussed in the September 25, 2006 *Monitoring Well Network Plan*.

CURRENT REMEDIATION ACTIVITIES

Remediation activities continue to proceed 24 hours per day, seven days per week. As stated above and in the site status updates, remediation activities are currently being conducted on up to 80 extraction wells at the site and surrounding properties, utilizing submersible pumps, SVE and DPE. Remediation systems and mobile units are employed onsite and on properties to the southwest and northeast of the intersection of Routes 145 and 146. The majority of remediation piping on non-ExxonMobil-owned properties has been buried and flush-mounted well vaults have been installed to enclose the recovery wellheads. All remaining above grade piping, hose, and electric lines are inspected at least daily, and all above-grade lines in traffic areas are protected. Fencing has been installed to provide additional security around the remediation equipment located on the station property, 3313 Papermill Road, 3410 Sweet Air Road, 3418 Sweet Air Road and 3508 Hampshire Glen Court.

Groundwater Recovery

Groundwater is currently being recovered using submersible pneumatic and electric pumps, and through dual phase extraction. The layout of the remediation well network, including recovery activity type for each remediation well, is depicted on Figure 2. The pumping system currently includes both pneumatic and electric submersible pumps, pneumatic air line, water return pipe, air compressors, and generators. The majority of the remediation system piping is buried on non-ExxonMobil owned properties in both the NE and SW. The water return lines daylight in the NE at 3418 Sweet Air Road, and on the station property in the SW. The water return lines are then valved to allow for flow to the groundwater treatment systems operating in each quadrant, or to 21,000 gallon fractionating tanks staged on each quadrant. Approximately 80-100% of recovered groundwater is sent to the groundwater treatment systems for onsite treatment and discharge to the surface water bodies in each quadrant. When groundwater accumulates in the fractionating tanks, the tank contents are transported offsite as needed by tanker trucks for disposal at International Petroleum Corporation in Wilmington, Delaware. The total amount of water discharged and transported offsite is reported to the MDE in the site status updates. As reported in the September 18, 2006 Site Status Update, approximately 8.5 million gallons of groundwater have been transported offsite for disposal and approximately 2.6 million gallons have been discharged to surface water in accordance with the NPDES Permit No. 2006-0GR-9826A [MDG919826A].

The MDE Water Management Administration - Water Supply Program has issued State Water Appropriation Permit No. BA2006G003(01) for a maximum average withdrawal of 10,000 gallons per day. ExxonMobil has submitted a revised withdrawal permit application and is in the process of preparing supporting documentation for the requested withdrawals, which will be covered under separate permits for the NE subwatershed [BA2006G003(01)], and the SW subwatershed [BA2006G003(02)].

Groundwater Treatment Systems

The majority of recovered groundwater, treated by air stripping, bioreactors and carbon filtration systems located onsite, at 3313 Papermill Road and 3418 Sweet Air Road, is also being discharged under the NPDES permit to the headwaters of the streams to the northeast and southwest of the site. Currently approximately 80 to 100% of all water recovered from the extraction well network is treated and then discharged to surface water. Discharge occurs after sampling results are obtained verifying that the concentrations are less than the permit discharge limits.

Onsite treatment of groundwater from the southwest quadrant began on May 15, 2006, utilizing a mobile treatment system consisting of an air stripper, particulate bag filters and carbon adsorbers. Air stripper offgas is treated with vapor granular activated carbon prior to discharge to the atmosphere under the MDE Air and Radiation Management Administration (ARMA) general permit for SVE (Permit ID No. 005-9-1295). In August 2006, a bioreactor treatment system was brought online at the station for additional groundwater treatment capacity in the SW quadrant. The MDE approved the use of the bioreactor in the treatment process in an August 18, 2006 email. The bioreactor treatment train consists of particulate bag filters, an influent sump with nutrient feed and pH adjustment, a fluidized bed designed for upflow of process water through the biomedial, and a treated water sump where re-oxygenation occurs, prior to pumping bio-treated water through carbon adsorbers for polishing. Through September 18, 2006, approximately 1.1 million gallons have been treated and discharged in the southwest quadrant.

Treatment of groundwater from the northeast quadrant began on May 27, 2006, utilizing a mobile treatment system consisting of an air stripper, particulate bag filters and carbon adsorbers. A second mobile treatment system, also consisting of an air stripper, particulate bag filters and carbon adsorbers was brought online in the northeast on June 16, 2006. Air stripper offgas is treated with vapor granular activated carbon prior to discharge to the atmosphere under the MDE ARMA general permit for SVE (Permit ID Nos. 005-9-1289 and 005-9-1259). Through September 18, 2006, approximately 1.5 million gallons have been treated and discharged in the northeast quadrant.

Vapor Phase Hydrocarbon Recovery

Vapor phase hydrocarbon recovery is currently conducted using four SVE/DPE systems in the southwest, and four SVE/DPE systems in the northeast. The off gas of each system in the southwest quadrant is treated through the flame oxidizer unit staged to the southwest of the station, in accordance with the MDE ARMA general permit for SVE (Permit ID No. 005-9-1258). The off gas of each SVE/DPE system in the northeast quadrant is treated through either a flame oxidizer unit or a thermal oxidizer unit, both located at 3410 Sweet Air Road, in accordance with the MDE ARMA general permit for SVE (Permit ID Nos. 005-9-1261 and 005-9-1285).

Current Remediation System Areas

The current locations of the remediation equipment being utilized for the interim remediation activities are depicted on Figure 2. These remediation systems have been grouped into nine areas as follows:

1. SVE with Flame Oxidizer (onsite) – This SVE blower extracts vapors from onsite extraction wells. The flame oxidizer treats all extracted soil vapors from extraction wells in the southwest quadrant.

2. Fractionating Tanks (onsite) – The two onsite 21,000 gallon fractionating tanks are used for influent equalization and temporary storage of recovered groundwater from the southwest quadrant, including fluids from submersible pumping and dual phase extraction wells.
3. SVE (onsite) – This equipment extracts vapors from extraction wells located onsite, on 3313 Papermill Road and 14223 Robcaste Road.
4. DPE (onsite) – This high vacuum DPE system extracts soil vapors and groundwater from onsite extraction wells.
5. SVE (onsite) – This equipment extracts vapors from extraction wells in the former tankfield area onsite.
6. SVE systems with Flame Oxidizer and Thermal Oxidizer, and Fractionating Tanks (3410 Sweet Air Road) – These SVE systems extract vapors from extraction wells in the northeast quadrant on 14301 Jarrettsville Pike, 14307 Jarrettsville Pike, 3501 Hampshire Glen Court and 3503 Hampshire Glen Court. These oxidizers treat all extracted soil vapors from extraction wells in the northeast quadrant. The three 21,000 gallon fractionating tanks are used to store recovered groundwater from the northeast quadrant that is not processed through the treatment systems.
7. DPE Trailer with groundwater treatment system (3418 Sweet Air Road) – This high vacuum DPE system extracts vapors and groundwater from extraction wells in the northeast quadrant on 14307 Jarrettsville Pike and 3503 Hampshire Glen Court. This trailer also houses groundwater treatment equipment including an air stripper, bag filters and carbon adsorbers.
8. SVE (3508 Hampshire Glen Court) – This SVE blower extracts vapors from offsite extraction wells in the northeast quadrant on 3506 Hampshire Glen Court, 3508 Hampshire Glen Court, 3600 Hampshire Glen Court, 3605A Southside Avenue and 3605B Southside Avenue.
9. Groundwater Treatment (onsite and 3418 Sweet Air Road) – Treatment is accomplished utilizing air strippers, particulate bag filters, carbon adsorbers and bioreactors (currently, only the bioreactor at the station property is online for treatment of water prior to discharge; the northeast bioreactor is in testing mode), and fractionating tanks for storage of treated groundwater prior to discharge. These areas also contain air compressors to operate the pneumatic pumps.

PLANNED REMEDIATION ACTIVITIES

ExxonMobil plans to continue with the interim remediation approach as described above, to maximize hydrocarbon recovery and induce hydraulic control. As requested in the MDE's August 23, 2006 correspondence, ExxonMobil will notify the MDE of any planned modifications or additional remedial actions, and seek formal approval by the MDE pursuant to Code of Maryland Regulations (COMAR) 26.10.09.06B and 26.10.09.07. ExxonMobil will also notify the MDE in writing or via email if a remediation system is not operational for 24 hours or longer.

Additional planned remediation activities include:

- Coordination with BGE to complete electric power drops onsite and 3418 Sweet Air Road;
- Coordination with SHA and completion of permit to directionally drill under the intersection to allow for additional flexibility and optimization of groundwater treatment;
- Completion of the revised water appropriation permitting process;
- Installation of telemetry systems on all remediation equipment to allow for additional controls, monitoring, optimization, and security of remediation equipment;
- Completion of subsurface piping installation on ExxonMobil owned properties and restoration of areas already trenched on and offsite;
- Winterization of remediation equipment, including building modifications to the former station building to house the bioreactor inside;

- Further evaluation of ex-situ chemical oxidation for additional onsite groundwater treatment capacity. Additional details regarding this process would be submitted to the MDE for approval prior to implementing for treatment of water prior to discharge; and
- Planning for and designing long term remediation system components.

CONCLUSION

ExxonMobil is seeking MDE approval to continue the remediation activities described herein, in addition to those described in the March 27, 2006 IRM Plan. As requested in the MDE's August 23, 2006 letter, ExxonMobil will notify the Department and seek approval of any additional remedial activity modifications.

Table 1
Well Construction and Remediation Well Summary

Exxon #2-8671
14258 Jetterville Pike
Phoenix, MD
September 18, 2006

Well ID	Rocket Diameter (inch)	Well Diameter (inch)	Total Depth (feet)	Screen Length (feet)	Riser Length (feet)	FOC Elevation	Pump Type	SVE/DPE
MW-1	6	2	20	25	45	586.85		
MW-1A	10	6	15	20	55	586.08	Pneumatic	SVE
MW-2	6	2	20	30	50	586.38	Pneumatic	
MW-2A	10	6	15	20	55	587.50		
MW-3	6	2	20	30	50	590.81		DPE
MW-3P	6	2	10	20	50	590.01		
MW-4	6	2	15	35	90	586.41		DPE
MW-4A	10	6	15	20	55	586.08		
MW-5	10	6	20	25	45	585.74		
MW-6	10	6	20	30	50	589.01		DPE
MW-6P	6	2	30	20	50	585.45		
MW-7	10	6	20	15	55	591.79		DPE
MW-8	6	4	25	20	45	590.55		
MW-9	6	4	25	25	50	589.17	Pneumatic	
MW-10*	10	-	-	-	34.5	-		
MW-11*	10	-	-	-	105	-		
MW-12	10	4	20	15	35	587.90		
MW-13	6	4	25	10	35	589.30		DPE
MW-11P	6	2	10	20	50	591.54		
MW-14	6	4	20	15	45	593.61		
MW-15	10	4	15	20	35	584.29		
MW-16	8	6	20	18	36	591.95		DPE
MW-17	6	4	15	25	50	589.19	Pneumatic	SVE
MW-18*	10	-	-	-	40	-		
MW-19	10	6	20	25	45	587.43	Pneumatic	SVE
MW-20	8	4	20	20	40	587.80		
MW-21	10	6	20	25	45	586.81	Pneumatic	SVE
MW-22	10	6	20	25	45	587.01	Pneumatic	SVE
MW-23	10	6	20	25	45	585.66	Pneumatic	SVE
MW-24	8	4	20	15	35	586.32	Pneumatic	SVE
MW-25	10	6	15	10	35	592.14	Pneumatic	SVE
MW-26	10	6	25	20	45	579.75	Pneumatic	SVE
MW-27	10	6	27	18	63	592.89		DPE
MW-27P	6	2	15	10	55	592.00		
MW-28	10	6	20	25	40	582.88	Pneumatic	SVE
MW-29	10	6	10	20	30	571.52	Pneumatic	SVE
MW-30	10	6	10	25	35	571.22	Pneumatic	SVE
MW-30P	3	3	15	15	50	564.35		
MW-31	10	6	10	20	30	575.52	Pneumatic	SVE
MW-32	10	6	10	20	30	595.08	Pneumatic	SVE
MW-33	10	6	10	20	30	570.80	Pneumatic	SVE
MW-33P	3	3	15	25	40	563.65		
MW-34	10	6	10	20	30	572.49	Pneumatic	SVE
MW-34P	3	3	18	20	38	565.06		
MW-35	10	6	10	20	30	571.58	Pneumatic	SVE
MW-36	10	6	15	10	30.5	590.40		DPE
MW-36P	6	2	15	20	45	589.81		
MW-37	10	6	40	50	100	571.26	Pneumatic	SVE
MW-37P	6	2	30	60	80	590.81		
MW-38	10	6	25	40	70	595.05	Pneumatic	SVE
MW-38P	6	2	23	40	63	593.92		
MW-39	10	6	15	20	35	574.50		
MW-40	10	6	5	24	30	570.08	Pneumatic	SVE
MW-41A	6	2	15	20	35	585.12		
MW-41B	6	2	48	10	58	548.55		
MW-41C	6	-	-	-	350	540.37		
MW-42A	6	2	15	20	35	575.72		
MW-42B	6	2	45	10	55	580.00		
MW-43A	6	2	20	20	40	575.00	Pneumatic	SVE
MW-43B	6	2	45	10	55	575.94		
MW-44	6	4	20	20	40	577.62		
MW-45	10	6	53	20	35	581.71	Pneumatic	SVE
MW-45P	6	2	52.5	20	72.5	593.50		
MW-46	6	4	15	25	60	587.20		
MW-47A	6	2	20	20	60	563.71		
MW-47B	6	2	45	10	55	581.85		
MW-48A	6	2	10	20	40	569.69		
MW-48B	6	2	45	10	55	569.69		
MW-49	10	6	20	25	45	567.48	Pneumatic	SVE

Table 1
Well Construction and Remediation Well Summary

ES&M #2-8077
14236 Jurekville Pike
Pinebluff, MD
September 18, 2006

Well ID	Borehole Diameter (inches)	Well Diameter (inches)	Total Depth (feet)	Screen Length (feet)	Riser Length (feet)	TDC Elevation	Pump Type	SVE/DPE
MW-50	6	4	29	20	40	581.85		
MW-50L	6	4	29	20	40	581.60		
MW-51	10	6	20	15	45	566.21	Pneumatic	SVE
MW-52	10	6	20	10	20	562.06	Pneumatic	SVE
MW-53A	6	2	15	20	35	519.96		
MW-53B	6	2	45	30	55	539.66		
MW-53C	6	6	2	2	350	578.57		
MW-54	10	6	16	40	56	592.83		
MW-55	10	6	10	30	40	552.25	Pneumatic	SVE
MW-56A	9	2	15	20	35	540.23		
MW-56B	9	2	45	16	35	540.24		
MW-56C	6	6	2	2	330	540.10		
MW-57	10	6	25	40	65	583.18	Pneumatic	SVE
MW-57P	6	2	20	30	20	582.60		
MW-58	10	6	15	10	65	561.33	Pneumatic	SVE
MW-58P	6	2	20	50	70	582.64		
MW-59A	6	2	20	20	40	571.01		SVE
MW-59B	6	2	45	30	55	571.19	Pneumatic	
MW-59D	10	6	25	25	50	571.04	Pneumatic	SVE
MW-60	10	6	10	10	80	549.17	Pneumatic	
MW-61A	6	2	15	20	15	563.02		
MW-61B	6	2	45	30	55	563.35		
MW-62A	6	2	35	20	45	578.24		
MW-62B	6	2	45	30	55	577.49		
MW-63	10	6	26	20	40	546.02		
MW-64	10	6	5	25	10	545.43		
MW-65	10	6	5	25	20	516.19		
MW-66	10	6	5	25	30	535.51		
MW-67	10	6	10	10	60	542.78		
MW-68	8	4	5	25	30	526.19		
MW-69	6	4	5	25	30	523.06		
MW-70	10	6	25	25	30	552.70		
MW-71	10	6	10	30	40	552.17	Pneumatic	SVE
MW-72	10	6	10	30	40	536.65	Pneumatic	SVE
MW-73	10	6	20	40	60	600.17		
MW-74	10	6	20	30	50	577.16		DPE
MW-75	10	6	25	25	50	574.00		DPE
MW-76	10	6	20	16	50	550.30	Pneumatic	SVE
MW-76P	6	2	20	30	50	560.29		
MW-77A	10	6	30	15	25	548.96	Pneumatic	SVE
MW-77B	10	6	33	10	43	548.08	Pneumatic	SVE
MW-77C	10	6	15	30	50	548.58	Electric	SVE
MW-78A	8	4	2	18	22	530.77		
MW-78B	10	6	15	10	45	530.42		
MW-78C	6	6	2	2	350	531.42		
MW-78R	10	6	20	50	35	530.40	Pneumatic	
MW-79	6	4	2	3	30	521.43		
MW-80A	10	6	5	25	35	542.43	Pneumatic	SVE
MW-80B	10	6	18.5	30	40.5	542.58	Pneumatic	SVE
MW-81	10	6	5	20	25	540.77		
MW-82	10	6	5	20	25	540.11	Pneumatic	SVE
MW-83R	10	6	1	15	40	546.64	Electric	SVE
MW-84	10	6	30	15	25	553.96		
MW-84R	10	6	20	30	10	554.78		SVE
MW-84P	10	6	40	20	60	552.05	Pneumatic	SVE
MW-84P	6	2	40	20	60	553.13		
MW-85	10	6	40	10	60	551.65	Pneumatic	SVE
MW-85P	6	2	15	25	60	551.17		
MW-86	10	6	40	20	60	553.05		
MW-86P	6	2	15	25	60	550.86		
MW-87	10	6	40	20	60	550.96		
MW-87P	6	2	15	25	60	550.62		
MW-88	10	6	17.5	20	60	552.47		
MW-88P	6	2	40	20	60	552.71		
MW-89	8	4	10	25	40	562.04		
MW-90	10	6	20	10	30	578.32		SVE
MW-91	10	6	60	20	75	583.77		
MW-92	6	2	60	20	100	557.70		
MW-93	6	2	29	15	45	579.64		

Table 1
Well Construction and Remediation Well Summary

Exxon #2-80771
14258 Invernessville Pike
Phoenix, MD

September 13, 2006

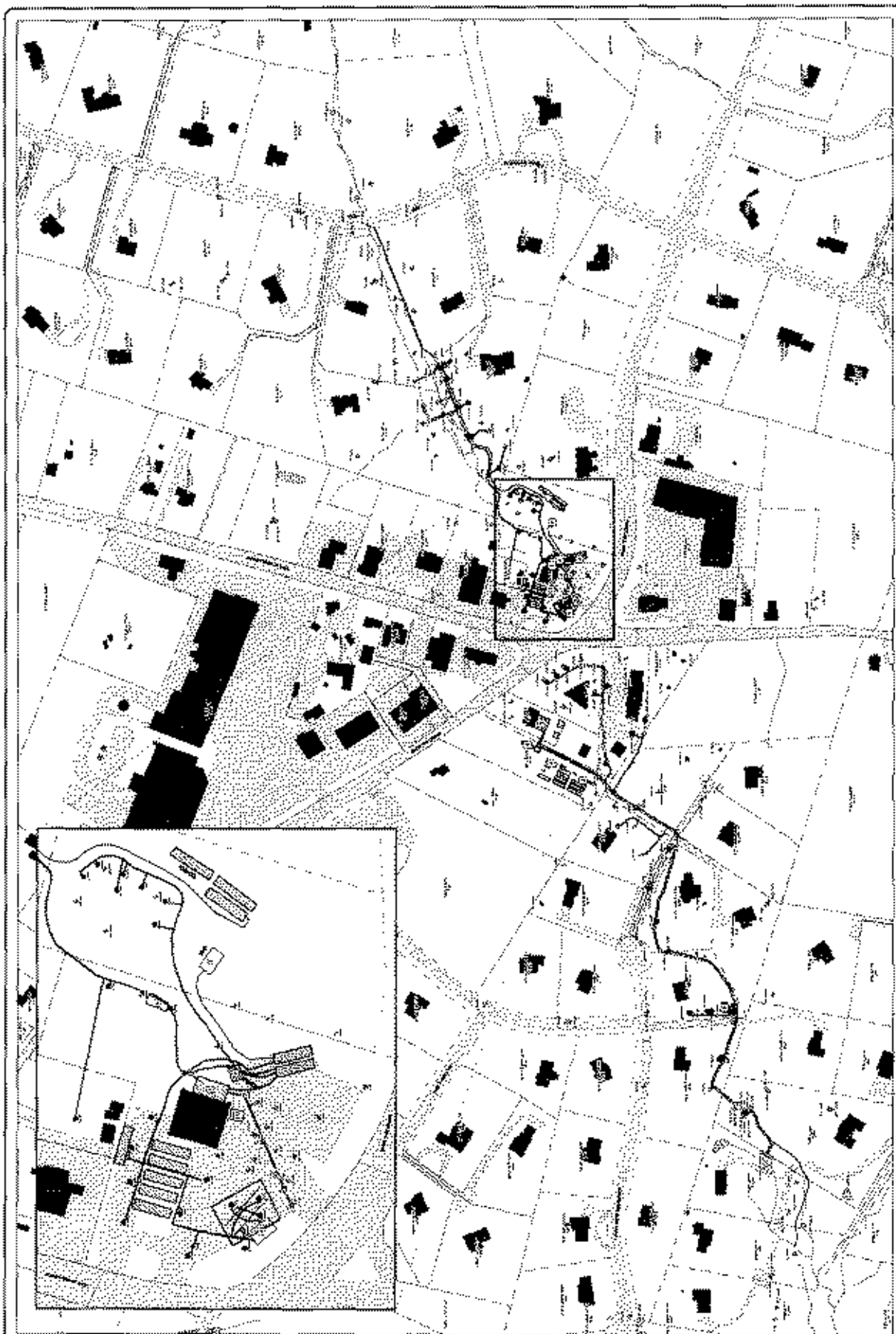
Well ID	Borehole Diameter (inches)	Well Diameter (inches)	Total Depth (feet)	Screen Length (feet)	Riser Length (feet)	TWC Elevation	Pump Type	SVT/DPE
MW-94	6	2	17	13	37	558.28		
MW-95	6	2	2	18	21	528.49		
MW-96A	8	4	4	30	25	539.78		
MW-96B	8	4	18	15	55	539.26		
MW-97	8	4	4	10	34	541.31		
MW-98A	6	2	25	16	41	543.67		
MW-98B	10	6	43	16	65	547.14		
MW-99A	10	6	1	12	35	555.26		
MW-99B	10	6	29	15	42	534.25		
MW-100A	10	6	1	11	33	534.92		
MW-100B	10	6	12	16	45	533.86	Pneumatic	SVT
MW-101A	10	6	1	12	15	517.64		
MW-103B	10	6	24	16	50	526.83		
MW-101	10	6	2	27	25	555.75	Pneumatic	
MW-101	8	4	31	20	57	592.40		
MW-104	8	4	30	20	30	562.45		
MW-105	10	6	24	22	30	502.54		
MW-106	10	6	8.5	20	30	547.68		
MW-107	8	4	15	30	45	584.91		
MW-108	10	6	35	20	55	601.47		
MW-109	10	6	20	40	70	580.10	Pneumatic	SVT
MW-110	10	6	25	35	40	655.10	Pneumatic	SVT
MW-111	10	6	30	18	10	535.46	Pneumatic	
MW-112	10	6	33	30	50	555.92	Electric	SVT
MW-113	10	6	35	15	10	548.07	Pneumatic	
MW-114	8	4	25	15	40	586.86		
MW-115*	8	-	-	-	48.5	-		
MW-116	10	6	32	31	63	573.08	Electric	SVT
MW-117	10	6	30	50	67	554.29	Pneumatic	
MW-118	10	6	20	20	40	562.00	Pneumatic	SVT
MW-119	10	6	35	25	40	554.35	Pneumatic	
MW-120	10	6	15	25	40	554.60		
MW-121	10	6	15	25	40	551.62		
MW-122	10	6	20	10	50	550.45		
MW-123	10	6	15	35	30	550.45	Pneumatic	
MW-124	10	6	13	13	38	553.50	Pneumatic	
MW-125	10	6	12	13	55	574.08		
MW-126	10	6	14	15	41	568.76	Pneumatic	
MW-127	10	6	28	25	53	571.25	Pneumatic	
MW-128A	10	6	18	20	58	563.75		
MW-128B	10	6	68	10	87	563.12		
MW-129A	10	6	31	20	45	566.56		
MW-129B	10	6	51	10	68	565.62		
MW-130	6	2	25	25	50	577.31		
MW-131A	8	2	5	15	25	526.93		
MW-131B	8	2	30	5	25	526.11		
MW-132A	8	2	2	15	17	524.73		
MW-132B	8	2	25	5	10	524.45		
MW-133A	6	2	15	15	30	549.05		
MW-133B	6	2	40	10	50	549.22		
MW-134A	6	2	20	25	55	544.04		
MW-134B	6	2	65	10	75	544.29		
MW-135A	8	4	20	20	40	560.64		
MW-135B	8	4	40	30	60	560.41		
MW-136	6	2	25	25	50	547.48		
MW-137	10	6	15	10	43	563.56	Pneumatic	SVT
MW-138	10	6	14	10	45	578.58		
MW-139	10	6	60	30	80	592.43		
MW-140A	8	2	10	10	10	548.03		
MW-140B	8	4	40	15	55	567.49		
MW-141A	6	2	30	10	50	586.34		
MW-141B	6	2	60	10	70	586.42		
MW-141C	6	-	-	-	300	586.31		
MW-142	10	6	10	15	63	583.87		
MW-143	10	6	10	15	63	584.39		
MW-144	8	6	15	15	62.5	593.11	Pneumatic	SVT
MW-145P	1	1	15	25	40	564.11		
MW-146	6	6	15	25	60	603.84		
MW-147	10	2	-	-	60	534.63		

Table 1
Well Construction and Remediation Well Summary

Exxon 62-8077
14258 Jannettsville Pike
Phoenix, MD
September 18, 2006

Well ID	Borehole Diameter Feet	Well Diameter Feet	Total Depth Feet	Screen Length Feet	Riser Length Feet	TOC Elevation	Pump Type	SVE/DPE
MW-147PA	6	2	8	72	80	514.53		
MW-147PB	10	2	8	72	80	514.43		
MW-147PC	6	2	8	72	80	514.32		
MW-148A	6	2	10	33	63	509.96		
MW-148B	6	2	10	30	60	509.97		
MW-149	10	6	39	50	50	505.94		
MW-150A	3	1	3	12	34	513.66		
MW-150B	3	1	24	10	14	510.83		
MW-151	8	4	15	24	60	504.78	Inaugural	SVE
MW-152	8	4	11	23	60	503.94	Pneumatic	SVE
MW-153A	8	4	5	20	23	548.58		
MW-153B	8	4	15	10	46	548.46		
MW-154	10	6	30	40	60	551.63	Pneumatic	SVE
MW-155	10	6	5	45	30	557.38	Pneumatic	SVE
MW-156	10	6	20	30	30	555.98		
MW-157P	6	2	10	50	60	552.60		
MW-158P	6	2	20	40	60	551.77		
MW-159	10	6	10	40	30	550.58		
MW-160	10	6	20	30	30	549.97		
MW-161	10	6	20	40	60	550.79		

TOC = Top of Casing
DPE = Dual Phase Extraction
SVE = Soil Vapor Extraction
* = Well Abandoned



- Legend**
- 1. Road (solid line)
 - 2. Road (dashed line)
 - 3. Road (dotted line)
 - 4. Road (solid line with cross-ticks)
 - 5. Road (solid line with cross-ticks and dots)
 - 6. Road (solid line with cross-ticks and dots and cross-ticks)
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 - 20. Road (solid line with cross-ticks and dots and cross-ticks and dots and cross-ticks and dots and cross-ticks and dots and cross-ticks and dots and cross-ticks and dots and cross-ticks and dots and cross-ticks and dots and cross-ticks)

NOTES:

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Scale:

1 inch = 1 mile

1 centimeter = 1 kilometer

Map No. 1000

Map Title: [Illegible]

Map Date: [Illegible]

Map Author: [Illegible]

Map Editor: [Illegible]

Map Reviewer: [Illegible]

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MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Boulevard • Baltimore Maryland 21230-1719

1-800-633-6101 • <http://www.mde.state.md.us>

DRINKING WATER SAMPLING AND ENVIRONMENTAL INVESTIGATION

Maryland State Police Barracks "D"

1401 Belair Road

Intersection of MD Route 147 (Harford Road) and US Route 1 (Belair Road)

Benson, Harford County, Maryland

MDE-Oil Control Program Case No.

Case No.

Case No. 1988-1547HAL

Status

Closed

Open

The Maryland Department of the Environment (MDE), Oil Control Program (OCP), continues to oversee cleanup activities related to petroleum releases at the Maryland State Police Barracks "D" property located in Harford County. At the time of the release all the property and the surrounding businesses were served by private drinking water wells. In 1997, public water became available to the subject property and those along the US Rt 1 corridor.

In 1981, the Department of Natural Resources, Water resources Administration (DNR-WRA precursors to the Maryland Department of the Environment) received a report of gasoline losses at the MSP Barrack. The Department closed its case in 1983, upon reviewing the results of a soil gas study confirming that contamination present on-site was confined to the active UST area.

In 1988, the Maryland Department of the Environment (MDE), in conjunction with the Maryland State Police (MSP), began an investigation to determine the source of petroleum vapors entering the MSP barrack. Under an MDE approved *Corrective Action Plan*, an active groundwater pump and treat remediation system was operated at this location from 1992 until January 1996 to remove petroleum contamination from the subsurface. Groundwater was pumped from two (2) recovery wells until the system was shut down in 1996. MSP continues to gauge and sample ten (10) monitoring wells on a quarterly basis. The MSP is responsible for the operation and maintenance of one (1) granular activated carbon filtration (GAC) unit at an adjacent business (1331 Belair Road).

The MSP have owned and operated registered underground storage tanks (UST) at this location for over 25 years. There are currently two (2) active UST systems at this location. These second generation tanks comprised fiberglass reinforced plastic tanks with fiberglass reinforced plastic piping (one 6,000-gallon gasoline tank and one 2,000-gallon oil tank) the gasoline UST system has Stage I and Stage II vapor recovery systems. These second generation tanks replaced a steel 6,000-gallon gasoline tank with no noted perforation and a 6,000-gallon gasoline, a 550-gallon fuel oil, and a 275-gallon waste oil all with noted perforations, removed in 1996. Currently, ten monitoring wells are located at this active facility.

Chronology:

- October 27, 1981: DNR-WRA (DNR-WRA precursors to the MDE) received a report of gasoline losses at the MSP Barrack.
- December 1, 1981: A completed subsurface investigation UST system identified the presence of liquid phase hydrocarbons (LPH) in the area immediately adjacent to the active gasoline underground storage tanks. Based upon the confined nature of the contamination the Department closed its open case in July 1983.
- 1988: MDE, in conjunction with the Maryland State Police (MSP) began an investigation to determine the source of petroleum vapors entering the MSP barrack.
 - February 19, 1988: MDE received notification that the #2 heating oil underground storage tank had been overfilled.

- February 24, 1988: MDE issued site complaint No. 000454 requiring the testing or removal of the UST systems.
 - February 25, 1988: Tank #1 was precision tested and passed.
 - March 1, 1988: MDE received complaints that petroleum odors continued to enter the building.
 - April 7, 1988: Water samples collected from a sump pit in the basement of the barrack revealed the presence of benzene at 90 parts per billion (ppb), and methyl tertiary butyl ether (MTBE) at 161ppb.
 - April 21, 1988: MDE determined that the release of gasoline identified on 1981 had migrated toward the barrack.
 - June 21, 1988: MDE issued requirements for the installation of a ventilation system in the barrack, and precision testing of the gasoline UST.
 - July 19, 1988: MDE aides the MSP with the installation of nine (9) groundwater monitoring wells.
 - September 27, 1988: Sampling results received from the nine (9) newly installed monitoring wells revealed the presence of benzene as high as 227 ppb and MTBE as high as 26 ppb.
 - September 15, 1988: Petrol-tight test identified several leaks within the vent and stage II vapor recovery piping.
- 1989: MDE conducted periodic site visits to gauge and manually remove LPH from the monitoring wells.
 - March 3, 1989: Measurable liquid phase hydrocarbons (LPH) were identified in the installed monitoring well adjacent to the UST system. The Department commenced the manual removal of LPH from the well.
- 1990: MDE conducted periodic site visits to gauge and manually remove LPH from the monitoring wells.
 - The Department continues the manual removal of LPH from the well.
- 1991: MDE conducted periodic site visits to gauge and manually remove LPH from the monitoring well.
 - March 13, 1991: MDE received a subsurface investigation work plan.
 - April 29, 1991: MDE approved the subsurface investigation work plan.
- 1992: MDE conducted periodic site visits and received *Quarterly Groundwater Remediation Reports*.
 - January 1992: MDE received the *Hydrogeological Evaluation of the Benson Barrack Report*.
 - Carbon filtration system installed on the sump in the basement of the barrack to treat sump discharge water.
 - Two 6-inch recovery wells installed.
 - Groundwater pump and treat installed and soil vapor extraction (SVE) systems prepared but not activated.
 - April 10, 1992: MDE approved the finalization of the SVE system.
 - October 2, 1992: MDE approved the one-month trial shut-down of the remediation system.
 - December 15, 1992: MDE site visit revealed the return of LPH to the monitoring well adjacent to the UST system.
- 1993: MDE conducted periodic site visits and received *Quarterly Groundwater Remediation Reports*.
 - Spring 1993: Groundwater remediation system restarted.
- 1994: MDE conducted periodic site visits and received *Quarterly Groundwater Remediation Reports*.
 - August 1994: MDE received notification of the pending remodeling and UST replacement at the Barrack.
- 1995: MDE conducted periodic site visits.
 - Pump and treat system not operational due to pending site upgrades.
- 1996: MDE conducted periodic site visits.
 - January 1996: MDE oversaw the removal of four (4) UST systems
 - One 6,000-gallon gasoline UST no perforation noted;
 - One 6,000-gallon gasoline, a 550-gallon fuel oil, and a 275-gallon waste oil all with noted perforations

- LPH was noted within the excavation
- Petroleum impacted soils removed and approved for on-site remediation.
- March 11, 1996: MDE issued Notice of Violation NV-96-073, requiring the removal of all petroleum impacted soils; the installation of 5 additional monitoring wells; and the re-start of the groundwater pump and treat system.
- March 18, 1996: MDE site visit to witness the installation of the replacement gasoline USTs.
- 1997: MDE conducted periodic site visits.
 - February 5, 1997: MDE letter to MSP reiterating the requirement to install additional monitoring wells and reinitiate the groundwater remediation system.
 - July 9, 1997: MDE on-site to witness the installation of three (3) required monitoring wells and one (1) replacement recovery well.
 - July 29, 1997: Sampling results received from the four (4) newly installed wells and six (6) previously installed wells revealed the presence of benzene as high as 1670 ppb and MTBE as high as 3690 ppb.
- 1998: MDE conducted periodic site visits and received *Quarterly Groundwater Monitoring Reports*.
 - November 20, 1998: MDE received notification of the MTBE (39.3 ppb) impact to the drinking water well serving 1331 Belair Road. GAC filtration was determined the only option.
 - Monitoring wells gauged and sampled quarterly.
 - MDE approved the removal of the remediation system.
- 1999: MDE conducted periodic site visits and received *Quarterly Groundwater Monitoring Reports*.
 - Monitoring wells gauged and sampled quarterly.
- 2000: MDE conducted periodic site visits and received *Quarterly Groundwater Monitoring Reports*.
 - Monitoring wells gauged and sampled quarterly.
- 2001: MDE conducted periodic site visits and received *Quarterly Groundwater Monitoring Reports*.
 - Monitoring wells gauged and sampled quarterly.
- 2002: MDE conducted periodic site visits and received *Quarterly Groundwater Monitoring Reports*.
 - February 7, 2002: MDE directed the MSP to begin quarterly sampling of the drinking water well at 1331 Belair Road and to assume the operation and maintenance of the GAC system.
 - Drinking water well at 1331 Belair Road sampled quarterly.
 - Monitoring wells gauged and sampled quarterly.
- 2003: MDE conducted periodic site visits and received *Quarterly Groundwater Monitoring Reports*.
 - Drinking water well at 1331 Belair Road sampled quarterly.
 - Monitoring wells gauged and sampled quarterly.
- 2004: MDE conducted periodic site visits and received *Quarterly Groundwater Monitoring Reports*.
 - Drinking water well at 1331 Belair Road sampled quarterly.
 - Monitoring wells gauged and sampled quarterly.
- 2005: MDE conducted periodic site visits.
 - April 5, 2005: MDE directive letter to MSP and ExxonMobil (MDE Case No 2002-1335HA) requiring the continued joint sampling of the drinking water well at 1331 Belair Road and quarterly sampling of the groundwater monitoring wells networks at both properties until the both parties in cooperation connected the property located at 1331 Belair Road to public water.
 - April 25, 2006: Meeting with MDE, MSP, ExxonMobil and the property owner of 1331 Belair Road to discuss logistics for connection to public water.
 - Drinking water well at 1331 Belair Road sampled quarterly.

Current Activities:

- 2006: MDE conducted periodic site visits.
 - July 2006: MDE received notification that the connection of the 1331 Belair Road Property to public water will be completed within one week.

Future Activities:

- MDE to direct one final round of groundwater sampling to access the site for potential closure.

Private Drinking Water Sampling Results near the MSP Barrack "D"

GAC Systems Installed	Sample location	Sample dates	Petroleum Constituents of Concern	
			MTBE (20 ppb - action level)	Other petroleum constituents
✓ GAC installed (1/1999)	1331 Belair Road	HCHD - 11/02/98	38.9	ND
		HCHD - 01/04/99	Pre-filter - 34.3 After filter - 39.3	ND
		HCHD - 02/22/01	Pre-filter - 29.1 After filter - 27.7	ND
		Exxon - 2002	ND	ND

Future Updates:

- Future updates on this case investigation will be posted at www.mde.state.md.us [at the MDE home page, (select) Land, (select) Program, (select) Oil Control, (select) Remediation Sites].

Contacts:

- Maryland Department of the Environment (MDE): 410-537-3443 (Oil Control Program)
- Harford County Health Department (HCHD) Gary Browning 443-643-0322

Disclaimer

The intent of this fact sheet is to provide the reader a summary of site events as they are contained within documents available to MDE. To fully understand the site and surrounding environmental conditions, MDE recommends that the reader review the case file that is available at MDE through the Public Information Act. The inclusion of a person or company's name within this fact sheet is for informational purposes only and should not be considered a conclusion by MDE on guilt, involvement in a wrongful act or contribution to environmental damage.